International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 06 | June 2019 www.irjet.net p-ISSN: 2395-0072

Automatic Vehicle Accident Detection and Rescue System

Sayeda Mudabbira urf Arifa Quadri [1], Shruti Jalapur [2]

[1]PG Student, Suhag colony bagalkote road, Vijayapur, Dept of Computer Science and Engineering, SIET, Vijayapur, Karnataka, India.
[2]Assistant Professor, Dept of Computer Science and Engineering, SIET, Vijayapur, Karnataka, India.

Abstract - The Rapid growth of technology and infrastructure has made our lives easier. The advent of technology has also increased the traffic hazards and the road accidents take place frequently which causes huge loss of life and property because of the poor emergency facilities. In this project, an IoT based vehicle accident detection and rescue information system is developed in order to detect vehicle accident and send the location information of the accident place to vehicle owner, nearest hospital and police station through message service. The accident is detected through impact and ultrasonic sensors.

Keywords: *IoT, Impact sensors, Ultrasonic sensors, GPS module, GSM modem.*

1. INTRODUCTION

The development in the field of automobiles is highly increasing and which leads to the accidents and so many hazards due to traffic. People's life are under high risk. This situation prevails, just because there is a lack of emergency facilities in our country. In our country, many people loose their life because of accidents. Because of causalities or improper communication to rescue team. We are in the process of solving this issue by proposing an efficient solution and to reduce the loss of lives as much as possible. In our theory, the design of the system help us to detect accidents in significantly minimum time and transfer the fundamental information to the first aid centre within a few seconds covering the geographical coordinates, the time and the angle where the vehicle had met with an accident. This alert message is sent to the rescue team(ambulance) and the registered mobile number within short period. This real time application saves many valuable lives .The message is sent through the GSM module and the location of the incident. The basic idea is to localize the vehicle system by receiving the real time position of the vehicle through GPS and send the information through GSM module through SMS service.

LITERATURE SURVEY

At present criteria, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual. The research work is going on for tracking of the vehicle even in dark clumsy areas where there is no network for receiving the signals. To protect the vehicle and tracking so many advanced technologies are available in now a days. In olden days the information of accident can be transferred, but the place of accident spot cannot be identified. In any vehicle airbags are designed, air bags are used for security and safety travels[2]. The air bag system was introduced in the year of 1968.

TPMS is system designed to control the pressure inside the pneumatic tires on vehicles that provides different operating conditions such as a lower tire pressure is desired in order to maximize traction, maneuvering through challenging terrain, pulling a heavy load out of an incline at slow speeds, crawling out of soft dirt. The pressure ranges from 15 to 45 PSI. Many other systems have been proposed to deduce the accident. The existing system deals with two sensors where MEMS sensor is used to detect the angle and vibration sensor is used for detection the change in the vehicle.

The other existing system uses IOT and cloud computing system. Where the vehicle detection is done through SVM (support vehicle machine) that is developed by Ant Colony Algorithm (ACA). Here IOT will monitor the vehicles using magneto resistive sensors. The main aim of this project is to differentiate the accidents which took place in traffic and at no traffic place. Existing system also provides the location of the accident using Atmega 328 Microcontroller and RF transmitter and receiver. The information is send to the saved mobile numbers[3].

This idea of automatic ambulance rescue system (AARS) is all about procuring the life of mishap individual. In previously proposed system if a vehicle has met with an accident, vibration sensor or fire sensor gives the electric signal to the microcontroller through signal conditioner. The location coordinates are identified using GPS and sent to the control centre using GSM modem. In control section, the GSM modem receives a message about the accident and sends it to PC. PC identifies the nearest ambulance and instructs to pick up the patient [3]. In this system, communication gets delayed due to the usage of GSM modem which is a slow process of transfer of a message and communication using GSM modem causes interference.

METHODOLOGY

To overcome the existing problem we will implement a new system in which there is automatic detection of the accident. A impact sensor is fitted in every vehicle and when an accident occurs, signals from the impact sensor are sent to the microcontroller. The signal is transferred from

microcontroller to the central unit using IoT platform. The GPS module provides the latitude and longitude coordinates of victim vehicle which are sent to the control using IoT platform. The central unit sends the location coordinates to the nearest ambulance and is instructed to pick up the victim. The central unit will be placed in a police station or a hospital that receives the signals from vehicle unit. It sends an alert message to the ambulance that is nearer to the location of the accident. The ambulance is also equipped with a GPS receiver for tracking of the accident location. This helps ambulance to reach the location in time and save the victim.

The following hardware components are used in this system

ARDUINO UNO: The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller. Simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

GPS Module: The Global Positioning System (GPS) is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth. GPS is made up of three parts: between 24 and 32 satellites orbiting the Earth, four control and monitoring stations on earth, and the GPS receivers owned by users. GPS satellites broadcast signals from space that are used by GPS receivers to provide three-dimensional location (latitude, longitude, and altitude) plus the time.

GSM Module: Here a GSM mobile hand set is used. GSM networks are originally from the most popular standard for mobile phones in the world, GSM differs from its predecessors in that both signaling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system. GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity.

Ultrasonic Sensor: It is a device that can measure distance of an object (obstacle) with the help of sound waves, usually this sensor is fixed in front end of the vehicle. By continuously transmitting a sound wave at a specific frequency and receiving that sound wave back, the device measures the distance of an object, present by recording the time period between transmitted and received sound wave. The operating voltage of this sensor is 5V.

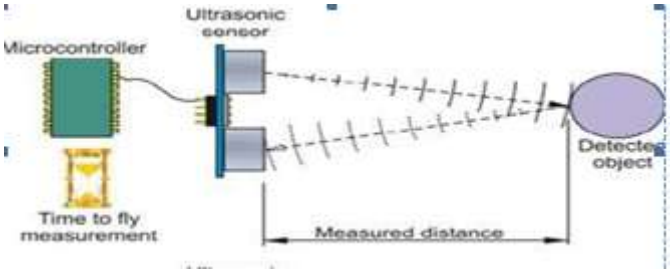

Fig. Sending and receiving messages

3. CONCLUSION

The proposed system deals with the accident alerting and detection. Arduino atmega 328 microcontroller is the heart of the system which helps in transferring the message to different devices in the system. Impact sensor will be activated when the accident occurs and the information is transferred to the registered number through GSM module. Using GPS the location can be sent through tracking system to cover the geographical coordinates over the area. The accident can be detected by a impact sensor which is used as major module in the system.

REFERENCES

[1] World Health Organization Road Traffic Injuries Fact Sheet No 358, March 2018.

[2] National statistics of road traffic accidents in India, September 2018.

[3]"Vehicle detection and reporting system using GPS and GSM." April 2017.

[4]http://www.ijerd.com/paper/vol10-issue4/Version_4/B1042528.pdf

[5] Sri Krishna Chaitanya Varma, Poornesh, Tarun Varma, Harsha, "Automatic Vehicle Accident Detection And Messaging System Using GPS and GSM Modems", International Journal of Scientific & Engineering Research, Volume 4, Issue 8, August 2016.

[6] Apurva Mane, Jaideep Rana, "Vehicle Collision detection and Remote Alarm Device using Arduino", International Journa of Current Engineering and Technology, Vol.4, No.3, June 2017.